Life-History Data on Alewife and Blueback Herring, Mactaquac Dam, 1975-81

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ABSTRACT

Jessop, B.M., A.H. Vromans and W.E. Anderson. 1982. Life-history data on alewife and blueback herring, Mactaquac Dam, 1975-81. Can. Data Rep. Fish. Aquat. Sci. No. 367, vii + 43 p.

Life-history data were collected annually between 1973 and 1981 for the alewife and blueback herring migrating to the Mactaquac Dam, Saint John River, New Brunswick. This report tabulates the data, in various combinations, according to species, sex, length, weight, age, maturity and spawning history.

Key words: Life-history, alewife, blueback herring, gaspereau, anadromous, Mactaquac Dam, Saint John River, hydroelectric development.

RÉSUMÉ

Jessop, B.M., A.H. Vromans and W.E. Anderson. 1982. Life-history data on alewife and blueback herring, Mactaquac Dam, 1975-81. Can. Data Rep. Fish. Aquat. Sci. No. 367, vii + 43 p.

Entre 1973 et 1981, on a recueilli chaque année des données relatives au cycle biologique du gaspareau et de l'alose d'été remontant la rivière Saint-Jean jusqu'au barrage de Mactaquac (Nouveau-Brunswick). Ce rapport présente les données sous forme de tableaux, en les combinant de diverses façons, selon l'espèce, le sexe, la longueur, le poids, l'âge la maturité et l'historique du frai.

INTRODUCTION

Creation of a large headpond on the Saint John River, New Brunswick, by the completion of the Mactaquac Dam in 1967 led to the rapid development of major stocks of alewives (*Alosa pseudoharengus*) and blueback herring (*A. aestivalis*), collectively and colloquially termed gaspereau. In 1973, a study was begun of the life history and population dynamics of the gaspereau of the Saint John River, with the objectives of: (1) establishing whether alewife and blueback herring populations are homogeneous within the river or form distinct local populations, (2) evaluating the influence of the commercial fishery and hydroelectric development on the populations, and (3) providing a data base for the establishment and evaluation of management programs.

This report presents tabulations of the life-history data collected annually between 1975 and 1981. The data for 1973 and 1974 are given in Jessop (1977 *a*, *b*).

Mactaquac Dam is the furthest downstream (148 km from the river mouth) of the three main-stem hydroelectric dams constructed on the Saint John River (Fig.). Its construction created a headpond of approximately 83.5 km^2, which extends about 104 km upriver. During low-flow periods, the dam is operated as a peak-load plant, and during high-flow periods (spring runoff and rainfall floods), as a base-load plant. Fish passage facilities include both a mechanical elevator and tank trucks, which in combination relay fish to release points upstream of the dam.

METHODS

During the run, random samples of 50 fish were collected weekly from the fish-lift between 1975 and 1977; in 1978 and 1979, 50 and 100 fish, respectively, were taken weekly; while in 1980 and 1981, 100 fish were taken twice weekly. Each fish was measured for fork and total length to the nearest millimetre, weighed to the nearest gram and identified as to sex, state of maturity and species. Scale saples were collected for aging. Maturity was classified according to Nikolsky (1963). Species were identified according to color of the peritoneum (Bigelow and Schroeder 1953) and, beginning in 1979, were cross-checked by scale morphology (MacLellan et al. 1981).

Whenever possible, scales were taken from the left side of each fish, just above the lateral line and behind the posterior edge of the dorsal fin. Eight to ten scales were placed on transparent plastic slides (Power 1964), and each sample was independently aged twice without reference to associated length or weight data. If readings differed, a third reading was made and an age assigned on the basis of majority agreement. A few fish were unageable, due either to a lack of scales, scales with regenerate centers or aging disagreements.

Age was determined for adult fish by counting the number of annuli and spawning marks and adding a year for the scale edge (Cating 1953; Marcy 1969). Fish under age four frequently exhibited "plus" growth, and judgement based upon capture date was used in deciding whether or not to add a year for the scale edge. Scale analysis included counting the number of transverse grooves in order to establish a criterion for locating annuli that were difficult to interpret.

The age at first spawning of mature, virgin (no previous spawns evident on scales) gaspereau was recorded as the age at capture during the spawning run. A small proportion of older, mature fish show checks, sometimes resembling spawning checks, between annuli laid previously at Age 2 and, occasionally, at Age 3. Such checks at Age 2 are presumed not to be spawning marks but evidence of freshwater entry, because virtually all (>99%) Age-2 fish sampled have been sexually immature and small numbers of immature fish (mostly alewives [>85%] and mostly Age 2, but with a few [<5%] Age 3) are frequently found in the lake system of the lower Saint John River, e.g., Washademoak and Grand lakes, during the latter part of the spawning run (mid- to late June). Non-annular checks at Age 3 were considered as spawning marks if well defined erosion and little plus growth to the annulus were evident; otherwise they were considered freshwater checks. The effect on spawning history patterns of any errors in judgement should be minimal, given the small numbers of fish involved.

RESULTS AND DISCUSSION

The data have been tabulated in various combinations according to species, sex, length, weight, age, maturity and spawning history (Tables 1-17). Between tables, totals may not always agree due to incomplete data; i.e., unageable scales. No analysis has been presented of the data contained in this report; the analysis will be made in a subsequent technical report.

Conversion between fork and total lengths can be made for alewives in the fork length interval from 130 mm to 320 mm and for blueback herring in the interval from 180 mm to 270 mm, respectively, by using the following geometric mean regressions (Ricker 1973): (a) $Y = 0.8819X + 0.0054$, $n = 302$, $r^2 = 0.998$ and (b) $Y = 0.8857X + 1.4413$, $n = 198$, $r^2 = 0.992$, where Y = fork length and X = total length. For alewives, the symmetrical 95% confidence intervals about an estimated value of Y($\bar{Y}$) were $\pm$0.68, $\pm$0.42, $\pm$0.28, $\pm$0.42 and $\pm$0.68 mm at X values of 150, 200, 250, 300 and 350 mm, respectively. For blueback herring, the 95% confidence intervals about an estimated value of Y were $\pm$1.10, $\pm$0.60, $\pm$0.27 and $\pm$0.60 mm at X values of 150, 200, 250 and 300 mm, respectively.

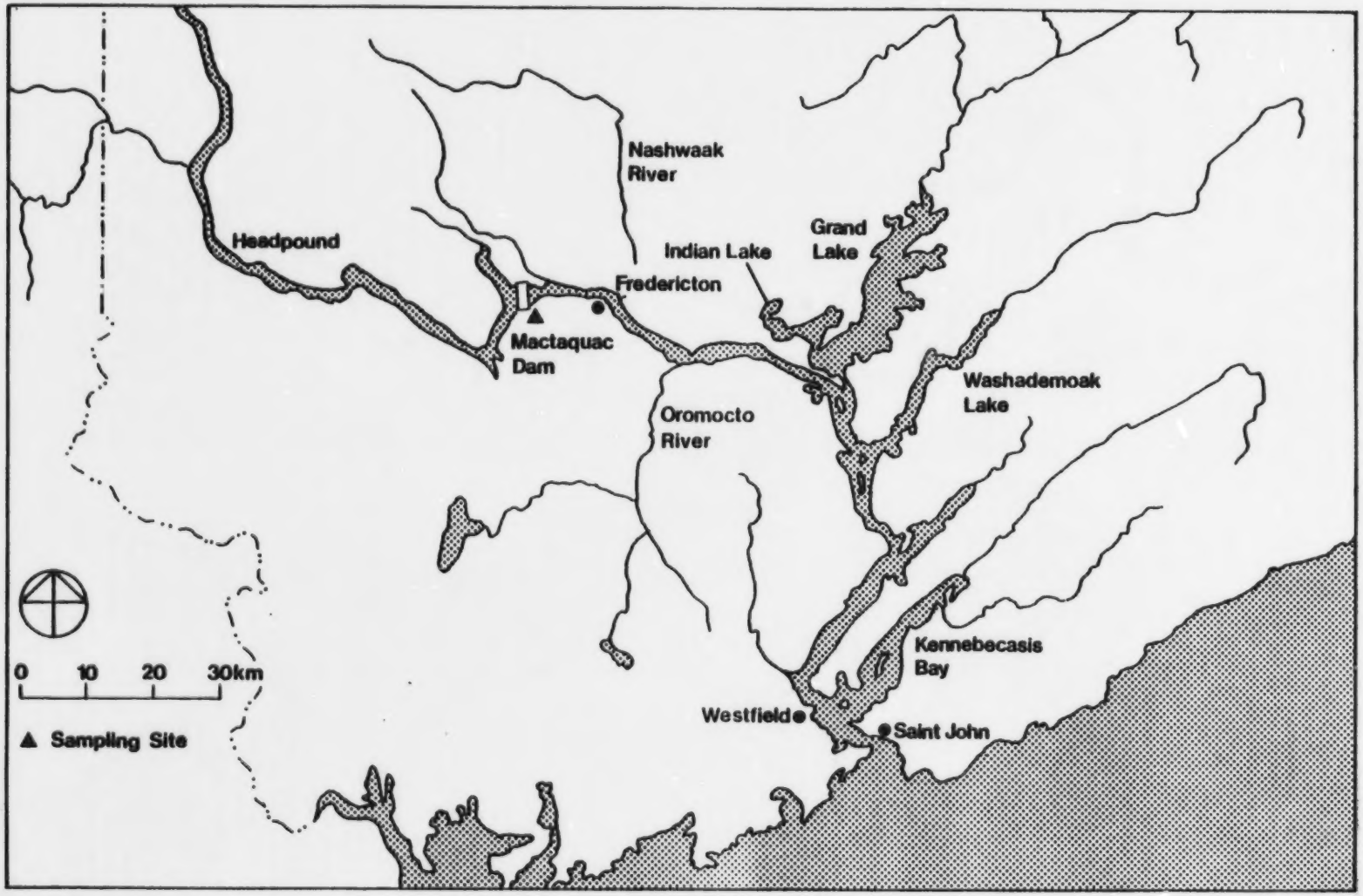

FIG. Lower Saint John River system, showing location of Mactaquac Dam.

TABLE 1a. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1975.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	47	237.3	214-237	7.62	20	243.1	225-255	8.70
5	33	251.8	215-283	14.72	36	262.1	231-295	14.56
6	55	264.6	168-286	16.40	34	272.2	200-297	17.04
7	18	275.2	252-295	9.12	30	283.8	260-301	8.14
8	4	279.5	270-288	7.77	3	288.7	282-296	7.04

TABLE 1b. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1976.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	7	244.0	236-250	5.57	2	257.0	254-260	4.24
5	43	254.3	226-287	12.52	39	260.0	235-282	10.69
6	55	266.3	225-299	14.04	35	273.8	254-303	11.45
7	32	273.9	230-297	12.51	31	287.7	272-300	8.33
8	8	281.3	265-299	10.50	4	286.8	282-291	4.03

TABLE 1c Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1977.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	21	243.4	228-255	8.71	6	254.8	250-260	4.49
5	32	254.3	228-275	9.16	31	261.3	243-280	8.96
6	47	267.3	245-290	9.60	33	271.8	255-295	9.45
7	22	274.6	260-290	7.09	24	283.1	260-305	11.11
8	4	278.8	270-285	6.29	7	291.1	285-300	5.40

TABLE 1d. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1978.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	10	238.6	218-252	13.05	0	-	-	-
5	82	257.2	219-278	10.64	58	267.8	247-285	7.98
6	74	267.8	249-281	7.29	76	274.1	256-294	8.03
7	37	273.7	252-294	8.84	37	281.6	259-297	9.42
8	9	277.4	265-289	6.99	16	291.6	277-310	8.37
9	2	284.5	269-300	-	3	294.0	284-300	8.72

TABLE 1e. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1979.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	2	228.5	227-230	-	-	-	-	-
4	27	244.8	231-262	7.15	9	253.9	238-278	14.30
5	70	259.2	229-281	10.79	46	267.3	240-286	10.23
6	181	275.4	255-297	7.71	139	285.1	263-306	7.66
7	60	280.8	260-303	9.06	44	292.9	275-318	9.09
8	15	279.8	269-299	7.91	10	295.9	275-305	9.22
9	3	277.0	265-289	12.00	2	294.0	291-297	4.24

TABLE 1f. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1980.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	27	258.8	237-280	10.21	20	262.5	245-292	10.88
5	91	265.8	244-287	8.06	85	275.4	255-295	9.10
6	64	276.7	260-298	8.45	67	284.5	256-305	8.96
7	145	282.8	258-305	7.80	156	293.6	264-324	8.74
8	37	285.2	262-300	9.05	65	298.9	275-323	8.60
9	7	292.9	284-307	8.75	25	299.2	273-313	9.79
10	1	282.0	-	-	1	309.0	-	-

TABLE 1g. Mean fork lengths of alewife, by sex and age, Mactaquac Dam, 1981.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	38	254.1	222-276	13.19	36	260.1	240-289	10.42
5	172	265.8	231-291	11.02	180	272.5	213-297	11.19
6	58	273.2	252-297	11.16	88	282.2	254-304	11.24
7	45	286.1	269-302	7.41	54	296.2	273-313	7.84
8	18	287.9	267-311	11.60	28	300.3	279-320	9.97
9	2	291.5	291-292	0.70	10	310.4	294-341	14.47
10	0	-	-	-	2	316.0	312-320	5.66

TABLE 2a. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1975.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	12	194.1	176-206	8.35	2	200.0	197-203	4.24
4	24	217.1	197-240	11.02	21	222.9	201-243	10.58
5	9	219.8	210-230	6.22	14	235.4	213-264	12.26
6	27	234.0	217-263	9.44	24	249.4	237-278	9.61
7	9	238.8	232-246	4.74	8	254.3	235-268	10.40
8	0	-	-	-	2	240.0	223-257	-

TABLE 2b. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1976.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	3	193.3	182-208	13.32	1	191.0	191-191	-
4	39	204.7	179-232	12.62	16	213.4	182-234	15.47
5	28	224.8	201-253	10.63	22	231.4	213-250	8.51
6	12	233.8	223-249	8.42	18	243.1	221-265	11.92
7	16	235.3	221-250	9.92	7	247.6	237-261	9.36
8	9	245.8	237-255	6.06	8	261.9	242-279	11.90
9	1	251.0	-	-	3	271.3	270-272	1.21

TABLE 2c. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1977.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	1	197.0	197-197	-	0	-	-	-
4	15	222.8	213-242	8.14	5	228.8	220-238	9.01
5	42	230.8	214-250	8.56	36	236.4	214-264	10.70
6	20	236.6	226-245	5.73	18	251.6	230-272	10.83
7	9	247.8	228-265	12.78	8	254.5	228-269	11.78
8	3	245.7	237-258	10.97	5	271.0	263-275	4.95
9	1	250.0	-	-	5	268.6	256-281	10.70

TABLE 2d. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1978.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	6	202.3	185-219	12.82	3	210.0	200-223	11.79
4	10	219.9	201-241	14.26	5	224.4	212-239	9.84
5	22	237.6	210-266	14.42	34	245.0	223-270	10.70
6	54	240.8	220-267	8.45	75	251.5	228-282	8.56
7	16	247.0	233-264	8.30	26	258.4	246-271	6.63
8	10	247.9	230-258	10.21	14	267.5	253-287	8.46
9	3	258.0	250-266	8.00	4	273.8	268-280	6.13
10	2	254.0	250-258	-	1	290.0	-	-

TABLE 2e. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1979.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	17	206.8	180-231	13.91	8	214.9	203-233	9.64
4	45	224.1	210-243	9.19	28	232.8	218-252	8.70
5	28	232.9	215-250	9.16	32	247.7	229-274	11.11
6	107	246.2	227-284	9.06	106	256.3	238-288	7.62
7	99	247.6	233-273	7.49	88	261.6	244-280	7.68
8	31	254.4	237-267	8.83	24	269.7	258-289	7.60
9	21	256.1	238-274	8.26	17	272.6	259-289	8.44
10	9	257.0	249-268	5.72	7	279.9	270-298	9.49
11	2	255.5	253-258	-	1	280.0	-	-

TABLE 2f. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1980.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	6	194.5	182-198	6.16	2	222.0	196-248	36.77
4	57	235.5	210-257	10.55	54	245.5	228-265	9.29
5	91	241.5	223-261	8.63	84	253.4	233-276	8.72
6	61	249.4	224-272	7.81	31	264.3	243-281	8.38
7	79	253.7	234-280	9.42	62	266.0	238-283	8.17
8	41	257.3	240-285	8.28	49	273.2	257-309	10.65
9	26	261.9	252-283	6.86	21	280.6	258-298	10.11
10	6	255.7	248-265	6.47	13	283.2	264-306	13.13

TABLE 2g. Mean fork lengths of blueback herring, by sex and age, Mactaquac Dam, 1981.

Age (yr)	Fork length (mm)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	15	208.2	187-227	10.08	4	227.0	214-237	10.92
4	59	228.2	198-254	12.39	49	240.2	206-261	13.45
5	115	241.2	221-275	10.34	146	251.0	221-272	11.26
6	38	248.6	230-273	9.92	66	261.0	243-282	8.08
7	31	256.4	240-274	7.65	22	268.8	250-285	9.55
8	40	262.0	249-287	7.67	31	271.1	255-292	9.85
9	23	259.9	245-278	5.96	20	278.8	257-304	11.48
10	4	261.3	253-270	6.99	8	283.9	275-294	6.71

TABLE 3. Spawning history of alewife, by sex and year, Mactaquac Dam.

No. previous spawnings	1975			1976			1977			1978			1979			1980			1981		
	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age
Male																					
0	42	26.8	4.3	52	20.6	4.3	40	31.8	4.5	107	50.0	5.2	97	27.1	5.0	136	18.3	4.5	170	51.1	4.9
1	47	29.9	4.9	74	29.2	5.0	20	15.9	5.5	41	19.2	5.8	172	48.1	5.9	151	20.4	5.3	50	15.0	5.2
2	46	29.3	6.1	70	27.7	6.0	49	38.9	6.2	36	16.8	6.5	44	12.3	6.6	218	29.4	6.4	67	20.1	6.3
3	20	12.7	6.9	35	13.8	6.9	15	11.9	6.9	26	12.2	7.2	28	7.8	7.3	109	14.5	6.9	29	8.7	6.5
4	2	1.3	7.5	18	7.1	7.7	2	1.6	8.0	2	0.9	8.5	14	3.9	7.4	70	9.4	7.6	12	3.6	7.6
5	0	-	-	3	1.2	8.0	0	-	-	2	0.9	8.5	2	0.6	8.5	30	4.0	8.4	5	1.5	8.2
6	0	-	-	1	0.4	9.0	0	-	-	0	-	-	1	0.3	9.0	21	2.8	9.0	0	-	-
7	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	5	0.7	10.2	0	-	-
8	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	2	0.3	11.0	0	-	-
Totals	157			253			126			214			358			742			333		
Repeat spawners		73.3			79.5			68.3			50.0			72.9			81.7			48.9	
Female																					
0	28	22.8	4.5	33	17.7	4.7	33	32.7	4.9	80	42.1	5.4	56	22.3	5.1	155	21.0	4.7	186	46.7	5.0
1	36	29.3	5.1	54	29.0	5.1	27	26.7	5.7	54	28.4	6.0	136	54.2	6.0	137	18.6	5.5	58	14.6	5.4
2	33	26.8	6.3	57	30.7	6.1	20	19.8	6.6	26	13.7	6.7	30	12.0	6.5	178	24.1	6.6	91	22.9	6.2
3	24	19.5	7.0	28	15.1	7.1	21	20.8	7.2	22	11.6	7.4	17	6.8	7.0	122	16.5	7.2	32	8.0	6.8
4	2	1.6	7.5	11	5.9	7.8	0	-	-	8	4.2	8.4	10	4.0	7.6	83	11.3	7.9	23	5.8	8.2
5	0	-	-	3	1.6	9.0	0	-	-	0	-	-	2	0.8	9.0	37	5.0	8.7	8	2.0	8.9
6	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	18	2.4	9.6	0	-	-
7	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	6	0.8	9.7	0	-	-
8	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-	2	0.3	11.0	0	-	-
Totals	123			186			101			190			251			738			398		
Repeat spawners		77.2			82.3			67.3			57.9			77.7			79.0			53.3	
Sexes combined																					
Repeat spawners		75.3			80.9			67.8			54.0			75.3			80.4			51.3	

TABLE 4. Spawning history of blueback herring, by sex and year, Mactaquac Dam.

No. previous spawnings	1975			1976			1977			1978			1979			1980			1981		
	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age	No.	%	Mean age
Male																					
0	23	28.4	3.5	35	32.4	4.0	15	16.5	4.3	15	12.2	3.8	46	12.8	3.8	53	14.3	4.2	69	21.0	4.1
1	23	28.4	4.5	32	29.6	4.8	34	37.4	4.9	27	22.0	5.3	37	10.3	4.6	69	18.7	4.8	104	31.7	4.8
2	12	14.8	5.9	13	12.0	5.5	23	25.3	5.6	44	35.8	5.9	71	19.8	6.0	73	19.7	5.5	39	11.9	5.6
3	18	22.2	6.2	12	11.1	6.8	14	15.4	6.6	19	15.5	6.6	101	28.1	6.5	75	20.3	6.7	29	8.8	6.3
4	5	6.2	7.0	12	11.1	7.5	3	3.3	7.3	11	8.9	7.6	53	14.8	7.1	49	13.2	7.5	40	12.2	7.5
5	0	-	-	3	2.8	8.0	2	2.2	8.5	4	3.3	8.5	32	8.9	8.5	25	6.8	8.4	24	7.3	8.3
6	0	-	-	1	0.9	9.0	0	-	-	3	2.4	9.7	12	3.3	9.2	19	5.1	9.0	18	5.5	9.1
7	0	-	-	0	-	-	0	-	-	0	-	-	6	1.7	10.2	5	1.4	10.2	2	0.6	9.5
8	0	-	-	0	-	-	0	-	-	0	-	-	1	0.3	11.0	2	0.5	11.0	3	0.9	11.0
Totals	81			108			91			123			359			370			328		
Repeat spawners		71.6			67.6			83.5			87.8			87.2			85.7			79.0	
Female																					
0	14	19.7	4.0	12	16.0	4.0	21	27.3	4.9	14	8.6	4.3	27	8.7	3.8	72	22.6	4.4	68	19.4	4.4
1	22	31.0	4.6	23	30.6	4.8	23	29.9	5.1	48	29.6	5.5	34	10.9	4.9	53	16.7	4.8	118	33.6	5.0
2	14	19.7	5.9	21	28.0	5.7	14	18.2	5.9	56	34.6	6.1	77	24.8	6.1	43	13.5	5.7	56	16.0	5.6
3	18	25.4	6.4	8	10.7	7.1	9	11.7	6.9	26	16.1	6.9	98	31.5	6.5	56	17.6	6.9	37	10.5	6.4
4	3	4.2	7.3	8	10.7	7.8	6	7.8	8.2	14	8.6	8.0	40	12.9	7.2	49	15.4	7.7	27	7.7	7.8
5	0	-	-	3	4.0	9.0	3	3.9	9.0	4	2.5	9.3	18	5.8	8.3	24	7.6	8.6	26	7.4	8.4
6	0	-	-	0	-	-	1	1.3	9.0	0	-	-	12	3.9	9.3	13	4.1	9.5	10	2.9	9.4
7	0	-	-	0	-	-	0	-	-	0	-	-	4	1.3	10.3	6	1.9	9.7	6	1.7	10.5
8	0	-	-	0	-	-	0	-	-	0	-	-	1	0.3	10.0	2	0.6	11.0	3	0.9	10.7
Totals	71			75			77			162			311			318			351		
Repeat spawners		80.3			84.0			72.7			91.4			91.3			77.4			80.6	
Sexes combined																					
Repeat spawners		76.0			75.8			78.1			89.4			89.3			81.6			79.8	

TABLE 5a. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1975.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	30	19.1	238.6	6.97	181.6	30.66
4	1	17	10.8	234.9	8.35	170.3	18.72
5	0	11	7.0	252.0	13.46	210.7	19.52
5	1	20	12.7	253.8	13.86	217.0	36.67
5	2	2	1.3	230.5	21.92	156.5	57.28
6	0	1	0.6	262.0	-	252.0	-
6	1	10	6.4	270.9	7.50	257.2	25.89
6	2	39	24.8	263.8	17.70	255.9	27.61
6	3	5	3.2	258.8	19.40	246.0	63.47
7	2	5	3.2	280.8	9.04	302.6	36.20
7	3	12	7.6	272.5	8.66	277.1	36.12
7	4	1	0.6	279.0	-	284.0	-
8	3	3	1.9	282.7	5.51	296.0	14.73
8	4	1	0.6	270.0	-	248.0	-
Female							
4	0	13	10.6	244.2	7.59	203.6	31.43
4	1	7	5.7	241.1	10.84	189.4	34.36
5	0	15	12.2	256.8	12.17	255.8	44.68
5	1	20	16.3	265.6	15.57	269.5	46.00
5	2	1	0.8	270.0	-	287.0	-
6	1	9	7.3	273.0	10.46	291.6	51.09
6	2	22	17.9	271.4	19.90	304.6	52.82
6	3	3	2.4	275.3	13.01	297.7	45.74
7	2	10	8.1	287.2	8.22	347.0	37.15
7	3	19	15.5	281.6	7.70	332.2	41.95
7	4	1	0.8	290.0	-	350.0	-
8	3	2	1.6	285.0	4.24	345.5	7.78
8	4	1	0.8	296.0	-	393.0	-

TABLE 5b. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1976.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	4	2.8	245.3	6.40	195.0	18.69
4	1	3	2.1	242.3	4.93	183.7	13.80
5	0	13	9.0	253.9	15.42	229.8	47.96
5	1	26	17.9	253.3	11.52	216.2	34.17
5	2	4	2.8	262.3	6.60	247.5	16.94
6	1	13	9.0	263.8	14.72	254.3	37.63
6	2	42	29.0	267.0	13.91	265.2	47.45
7	2	9	6.2	276.4	10.57	292.0	30.72
7	3	23	15.9	272.9	13.27	284.4	45.37
8	2	2	1.4	284.5	20.51	303.5	65.76
8	4	6	4.1	280.2	8.04	329.0	29.46
Female							
4	0	2	1.8	257.0	4.24	241.5	0.71
5	0	16	14.4	258.6	9.68	248.8	35.09
5	1	22	19.8	261.4	11.46	249.1	35.44
5	2	1	0.9	250.0	-	228.0	-
6	0	3	2.7	276.3	6.03	320.3	42.34
6	1	9	8.1	275.1	9.79	311.4	49.24
6	2	23	20.7	273.0	12.73	302.7	47.65
7	2	12	10.8	285.0	6.71	332.8	31.90
7	3	19	17.1	289.5	8.92	360.3	38.38
8	3	1	0.9	282.0	-	228.0	-
8	4	3	2.7	288.3	3.06	363.3	22.14

TABLE 5c. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1977.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	21	16.7	243.4	8.71	191.3	23.11
5	0	19	15.1	253.6	10.06	215.8	25.45
5	1	11	8.7	255.1	8.55	212.9	32.19
5	2	2	1.6	257.5	3.54	220.5	10.61
6	1	9	7.1	262.7	10.52	227.8	22.26
6	2	36	28.6	268.8	9.13	249.4	25.05
6	3	2	1.6	262.5	10.61	248.5	30.41
7	2	10	7.9	274.5	6.43	258.7	22.28
7	3	12	9.5	274.8	7.85	270.0	26.51
8	2	1	0.8	280.0	-	274.0	-
8	3	1	0.8	285.0	-	288.0	-
8	4	2	1.6	275.0	7.07	269.5	20.51
Female							
4	0	6	5.9	254.8	4.49	225.0	34.47
5	0	23	22.8	261.6	8.20	251.1	33.73
5	1	8	7.9	260.4	11.45	249.3	25.02
6	0	4	4.0	268.8	4.79	295.3	18.25
6	1	18	17.8	273.1	8.41	281.7	38.69
6	2	9	8.9	269.9	12.55	273.2	51.75
6	3	2	2.0	275.0	14.14	296.0	36.77
7	1	1	1.0	280.0	-	290.0	-
7	2	10	9.9	275.0	7.45	297.0	37.01
7	3	13	12.9	289.6	9.67	331.2	47.29
8	2	1	1.0	290.0	-	284.0	-
8	3	6	5.9	291.3	5.89	337.2	52.59

TABLE 5d. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1978.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	10	4.7	238.6	13.05	184.2	30.19
5	0	71	33.2	257.6	9.73	223.1	26.15
5	1	11	5.1	254.5	15.63	213.4	36.53
6	0	26	12.2	267.7	7.38	250.3	21.51
6	1	29	13.6	268.8	8.09	252.2	24.75
6	2	17	7.9	267.1	5.47	243.5	16.08
6	3	2	0.9	259.0	1.41	223.0	-
7	1	1	0.5	284.0	-	297.0	-
7	2	19	8.9	275.2	8.61	263.7	28.54
7	3	17	7.9	271.5	8.82	263.7	30.43
8	3	7	3.3	277.7	7.78	277.0	29.78
8	4	1	0.5	280.0	-	298.0	-
8	5	1	0.5	273.0	-	319.0	-
9	4	1	0.5	269.0	-	259.0	-
9	5	1	0.5	300.0	-	372.0	-
Female							
5	0	46	24.2	267.0	8.42	266.7	34.83
5	1	11	5.8	270.1	4.87	262.9	18.98
5	2	1	0.5	278.0	-	292.0	-
6	0	34	17.9	271.3	7.28	279.1	33.70
6	1	35	18.4	276.6	7.26	291.3	27.04
6	2	7	3.7	275.4	11.41	286.0	37.53
7	1	7	3.7	279.0	5.45	301.9	17.05
7	2	16	8.4	281.6	10.53	308.1	39.22
7	3	14	7.4	282.8	9.92	296.9	36.48
8	1	1	0.5	285.0	-	300.0	-
8	2	2	1.1	287.5	6.36	330.5	77.07
8	3	8	4.2	292.6	10.66	343.3	45.85
8	4	5	2.6	292.8	5.50	355.8	31.74
9	4	3	1.6	294.0	8.72	329.0	32.51

TABLE 5e. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1979.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	2	0.6	228.5	2.12	153.5	2.12
4	0	20	5.6	243.7	6.41	189.5	14.21
4	1	7	2.0	248.0	8.68	200.0	21.75
5	0	55	15.4	260.7	10.48	237.9	32.64
5	1	14	3.9	253.2	10.60	210.6	30.12
5	2	1	0.3	263.0	-	224.0	-
6	0	18	5.0	274.8	6.97	281.1	45.92
6	1	144	40.2	275.2	7.50	273.5	29.58
6	2	18	5.0	278.2	9.71	287.2	38.44
6	3	1	0.3	267.0	-	229.0	-
7	0	2	0.6	277.5	6.36	298.5	6.36
7	1	7	2.0	281.7	7.99	287.0	11.53
7	2	25	1.0	282.3	10.13	287.6	31.55
7	3	18	5.0	280.9	8.60	300.4	40.07
7	4	8	2.2	276.3	7.96	270.8	32.57
8	3	8	2.2	280.5	5.73	292.5	20.40
8	4	6	1.7	279.8	11.00	298.8	46.31
8	5	1	0.3	274.0	-	297.0	-
9	3	1	0.3	289.0	-	324.0	-
9	5	1	0.3	277.0	-	310.0	-
9	6	1	0.3	265.0	-	246.0	-
Female							
4	0	7	2.8	254.0	15.76	225.3	47.14
4	1	2	0.8	253.5	12.02	240.5	37.48
5	0	35	13.9	264.9	10.43	261.1	33.78
5	1	7	2.8	274.7	5.44	301.4	33.59
5	2	4	1.6	274.5	3.79	295.0	19.78
6	0	13	5.2	280.0	6.42	311.9	32.84
6	1	117	46.6	285.7	7.33	330.5	32.78
6	2	6	2.4	279.3	11.45	302.7	39.69
6	3	4	1.6	290.3	6.65	367.3	27.07
7	0	1	0.4	288.0	-	332.0	-
7	1	10	4.0	288.7	8.25	353.5	37.88
7	2	20	8.0	295.5	9.52	357.4	40.77
7	3	9	3.6	293.1	7.91	349.1	36.28
7	4	4	1.6	291.0	10.98	356.0	49.36
8	3	4	1.6	290.5	12.07	351.0	51.19
8	4	6	2.4	299.5	5.17	384.3	24.20
9	5	2	0.8	294.0	4.24	338.5	12.02

TABLE 5f. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1980.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	22	5.9	257.6	9.73	226.2	25.27
4	1	5	1.3	264.2	11.67	239.8	41.99
5	0	60	16.1	266.4	8.34	247.6	28.33
5	1	23	6.2	262.1	6.19	235.0	24.03
5	2	8	2.2	271.9	6.24	272.1	20.11
6	0	1	0.3	286.0	-	365.0	-
6	1	45	12.1	276.4	8.21	279.7	2[illegible]02
6	2	17	4.6	277.4	9.31	278.7	34.59
6	3	1	0.3	270.0	-	239.0	-
7	1	9	2.4	283.9	4.96	304.9	10.78
7	2	111	29.8	282.6	7.58	300.7	28.76
7	3	19	5.1	284.5	8.93	301.5	34.41
7	4	6	1.6	278.8	11.30	272.2	20.23
8	2	9	2.4	287.9	8.92	308.4	34.95
8	3	14	3.8	285.1	7.91	316.4	31.00
8	4	11	3.0	282.6	10.92	286.4	36.79
8	5	3	0.8	287.0	8.72	330.0	11.79
9	4	4	1.1	298.3	7.54	334.5	25.49
9	5	2	0.5	286.5	3.54	289.5	43.13
9	6	1	0.3	284.0	-	284.0	-
10	6	1	0.3	282.0	-	286.0	-
Female							
4	0	18	4.3	263.4	10.64	251.1	41.01
4	1	2	0.5	253.5	12.02	242.0	14.14
5	0	59	14.1	275.3	9.42	290.5	35.16
5	1	21	5.0	277.5	7.74	303.0	29.35
5	2	5	1.2	269.0	8.86	268.8	32.68
6	0	6	1.4	281.5	12.44	306.0	41.92
6	1	44	10.5	284.9	7.30	327.3	37.28
6	2	14	3.3	283.3	12.39	322.6	41.85
6	3	3	0.7	291.3	3.06	352.7	34.12
7	1	17	4.1	292.4	9.31	350.5	51.57
7	2	106	25.2	293.7	8.05	356.1	39.54
7	3	30	7.1	294.4	10.97	357.0	44.41
7	4	3	0.7	291.7	7.09	328.3	34.43
8	2	9	2.1	305.8	9.48	405.3	36.41
8	3	33	7.9	298.9	6.64	378.0	33.98
8	4	19	4.5	296.9	8.92	370.9	49.43
8	5	4	1.0	294.0	13.78	340.5	37.78
9	2	1	0.2	300.0	-	340.0	-
9	4	12	2.9	302.3	10.33	386.1	49.38
9	5	8	1.9	295.4	10.91	361.3	51.64
9	6	4	1.0	297.8	4.27	355.3	8.34
10	5	1	0.2	309.0	-	406.0	-
11	6	1	0.2	316.0	-	418.0	-

TABLE 5g. Mean fork length and weight of alewife, by age and sex, in relation to spawning history, Mactaquac Dam, 1981.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
4	0	34	10.2	254.1	13.85	214.7	29.80
4	1	4	1.2	254.0	6.77	229.3	14.91
5	0	119	35.7	265.4	11.40	249.6	35.87
5	1	33	9.9	264.6	11.16	250.5	42.58
5	2	20	6.0	270.8	6.95	270.9	26.77
6	0	17	5.1	268.1	11.25	254.7	38.50
6	1	13	3.9	272.8	11.95	265.7	38.09
6	2	18	5.4	277.2	8.18	290.8	29.89
6	3	10	3.0	275.4	13.40	282.4	50.45
7	1	1	0.3	288.0	-	287.0	-
7	2	30	9.0	285.4	7.00	305.9	27.81
7	3	10	3.0	285.8	9.34	304.9	43.43
7	4	4	1.2	291.5	5.00	328.0	34.38
8	2	3	0.9	273.3	10.12	282.0	57.71
8	3	5	1.5	292.4	11.46	343.8	52.84
8	4	6	1.8	287.7	6.65	308.7	31.75
8	5	4	1.2	293.8	12.39	321.3	37.23
9	4	1	0.3	292.0	-	344.0	-
9	5	1	0.3	291.0	-	331.0	-
Female							
4	0	32	8.0	260.1	10.96	249.1	37.87
4	1	4	1.0	260.0	4.97	243.5	7.59
5	0	124	31.2	272.4	10.39	287.2	38.27
5	1	25	6.3	269.8	9.73	277.6	35.89
5	2	31	7.8	275.0	14.95	300.9	39.23
6	0	30	7.5	275.2	9.09	303.8	33.52
6	1	29	7.3	286.2	10.53	325.2	43.98
6	2	17	4.3	285.1	9.55	325.5	41.15
6	3	12	3.0	285.8	12.71	317.7	49.03
7	2	42	10.6	297.2	7.86	372.4	36.56
7	3	10	2.5	293.3	6.83	361.7	29.06
7	4	2	0.5	288.5	7.78	313.5	2.12
8	2	2	0.5	289.0	14.14	328.5	36.06
8	3	9	2.3	302.2	9.51	386.3	47.70
8	4	14	3.5	302.1	9.45	393.6	52.52
8	5	3	0.8	293.3	7.77	352.0	24.64
9	4	7	1.8	312.4	15.37	395.0	44.23
9	5	3	0.8	305.7	13.61	417.3	82.00
10	5	2	0.5	316.0	5.66	441.5	65.76

TABLE 6a. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1975.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	12	14.8	194.0	8.35	92.1	31.26
4	0	11	13.6	223.7	9.78	126.2	16.39
4	1	13	16.1	211.5	8.89	117.4	36.60
5	1	8	9.9	219.0	6.65	123.9	11.05
5	2	1	1.2	220.0	-	132.0	-
6	1	2	2.5	241.0	7.07	167.0	7.07
6	2	11	13.6	238.0	12.21	163.9	32.75
6	3	14	17.3	233.5	6.71	155.5	16.75
7	3	4	4.9	241.0	5.25	163.5	16.11
7	4	5	6.2	236.8	3.62	162.2	12.09
Female							
3	0	2	2.8	200.0	4.24	90.0	5.66
4	0	10	14.1	224.1	11.28	134.0	19.29
4	1	11	15.5	221.7	10.31	134.7	21.51
5	0	2	2.8	223.5	4.95	141.5	4.95
5	1	10	14.1	238.1	13.20	171.5	37.96
5	2	2	2.8	234.0	-	151.0	15.56
6	1	1	1.4	238.0	-	158.0	-
6	2	12	16.9	249.8	7.22	187.8	16.17
6	3	11	15.5	250.0	11.90	198.8	31.35
7	3	6	8.5	258.2	7.44	221.2	16.39
7	4	2	2.8	242.5	10.61	165.0	18.38
8	3	1	1.4	257.0	-	229.0	-
8	4	1	1.4	223.0	-	141.0	-

TABLE 6b. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1976.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	3	2.8	193.3	13.32	85.3	17.93
4	0	28	25.9	203.9	14.52	102.9	24.24
4	1	11	10.2	206.6	5.56	105.1	10.11
5	0	4	3.7	235.8	14.10	168.5	46.47
5	1	17	15.7	225.1	9.65	140.7	20.62
5	2	7	6.5	217.7	4.68	129.0	15.11
6	1	4	3.7	238.8	7.04	170.8	24.61
6	2	6	5.6	229.3	4.59	149.2	13.95
6	3	2	1.9	237.0	16.97	169.0	36.77
7	3	10	9.3	237.0	10.23	160.2	26.77
7	4	6	5.6	232.3	9.50	154.2	19.73
8	4	6	5.6	247.0	6.03	205.0	19.94
8	5	3	2.8	243.3	6,51	199.3	25.11
9	6	1	0.9	251.0	-	203.0	-
Female							
3	0	1	1.3	191.0	-	83.0	-
4	0	10	13.3	208.5	16.22	119.2	26.33
4	1	6	8.0	221.7	10.69	143.3	19.43
5	0	1	1.3	213.0	-	120.0	-
5	1	15	20.0	231.2	8.32	156.7	26.12
5	2	6	8.0	234.8	5.34	171.0	13.87
6	1	2	2.7	251.5	2.12	196.5	6.36
6	2	15	20.0	240.5	10.97	175.5	33.14
6	3	1	1.3	265.0	-	262.0	-
7	3	5	6.7	250.6	9.56	207.6	38.36
7	4	2	2.7	240.0	-	182.5	17.68
8	3	2	2.7	276.0	4.24	276.5	3.54
8	4	6	8.0	257.2	9.39	229.5	19.24
9	5	3	4.0	271.3	1.15	270.7	23.03

TABLE 6c. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1977.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	1	1.1	197.0	-	94.0	-
4	0	8	8.8	225.4	8.68	140.0	21.96
4	1	7	7.7	219.7	6.91	126.7	15.24
5	0	6	6.6	235.2	10.19	157.3	27.35
5	1	25	27.5	228.6	7.84	142.0	15.71
5	2	11	12.1	233.4	8.38	158.0	21.25
6	1	2	2.2	236.0	2.83	152.5	10.61
6	2	11	12.1	237.4	5.90	170.0	16.43
6	3	7	7.7	235.4	6.45	173.0	16.08
7	2	1	1.1	258.0	-	209.0	-
7	3	6	6.6	246.5	9.99	183.7	31.16
7	4	2	2.2	246.5	26.16	190.5	57.28
8	3	1	1.1	258.0	-	210.0	-
8	4	1	1.1	237.0	-	151.0	-
8	5	1	1.1	242.0	-	178.0	-
9	5	1	1.1	250.0	-	179.0	-
Female							
4	0	4	5.2	229.0	10.39	148.0	18.35
4	1	1	1.3	228.0	-	150.0	-
5	0	15	19.5	235.5	9.43	167.3	19.63
5	1	19	24.7	236.7	11.98	166.6	26.89
5	2	2	2.6	245.5	0.71	198.0	1.41
6	0	2	2.6	240.0	14.14	194.0	42.43
6	1	3	3.9	252.7	17.21	212.0	51.96
6	2	12	15.6	252.4	8.60	211.8	22.49
6	3	1	1.3	262.0	-	258.0	-
7	3	8	10.4	254.5	11.78	210.6	47.47
8	4	5	6.5	271.0	4.95	275.2	10.28
9	4	1	1.3	256.0	-	222.0	-
9	5	3	3.9	276.0	4.58	276.0	43.00
9	6	1	1.3	259.0	-	249.0	-

TABLE 6d. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1978.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	6	4.9	202.3	12.82	98.7	19.60
4	0	6	4.9	220.2	14.82	130.5	27.31
4	1	4	3.3	219.5	15.59	129.0	23.42
5	0	3	2.4	246.0	16.82	227.7	31.56
5	1	12	9.8	233.4	14.53	164.4	34.46
5	2	7	5.7	241.0	12.75	177.3	25.82
6	1	11	8.9	242.2	10.95	173.6	17.53
6	2	35	28.5	240.8	8.32	173.8	17.27
6	3	8	6.5	238.8	5.01	165.4	15.84
7	2	2	1.6	251.5	0.71	214.0	14.14
7	3	10	8.1	243.4	7.04	175.9	12.91
7	4	4	3.3	253.8	8.81	195.5	14.71
8	3	1	0.8	248.0	-	188.0	-
8	4	7	5.7	246.7	12.16	184.6	23.49
8	5	2	1.6	252.0	2.83	207.5	17.68
9	5	2	1.6	258.0	11.31	220.5	38.89
9	6	1	0.8	258.0	-	203.0	-
10	6	2	1.6	254.0	5.66	203.5	9.19
Female							
3	0	3	1.9	210.0	11.79	113.7	22.85
4	0	5	3.1	224.4	9.84	142.4	15.85
5	0	5	3.1	247.4	11.84	197.4	35.09
5	1	26	16.1	244.5	10.74	189.4	25.92
5	2	3	1.9	245.3	12.22	191.0	23.07
6	0	1	0.6	262.0	-	253.0	-
6	1	21	13.0	248.4	7.46	194.2	21.68
6	2	47	29.0	251.5	7.81	205.4	22.37
6	3	6	3.7	261.0	11.38	240.0	46.44
7	1	1	0.6	269.0	-	302.0	-
7	2	6	3.7	255.7	6.38	207.8	10.11
7	3	18	11.1	258.4	6.37	224.4	16.34
7	4	1	0.6	265.0	-	249.0	-
8	3	2	1.2	274.0	2.83	282.0	45.25
8	4	12	7.4	266.4	8.65	244.9	26.78
9	4	1	0.6	278.0	-	311.0	-
9	5	3	1.9	272.3	6.66	280.3	28.43
10	5	1	0.6	290.0	-	317.0	-

TABLE 6e. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1979.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	17	4.8	206.8	14.23	105.0	19.46
4	0	27	7.5	224.0	9.10	135.7	19.65
4	1	18	5.0	224.5	9.88	136.6	21.46
5	0	3	0.8	243.0	7.55	174.7	24.54
5	1	12	3.3	229.0	7.85	146.2	12.84
5	2	13	3.6	234.1	9.35	155.9	18.76
6	0	1	0.3	271.0	-	268.0	-
6	1	5	1.4	262.6	13.33	223.2	43.65
6	2	45	12.5	243.1	7.25	177.5	17.63
6	3	56	14.6	246.7	7.72	187.0	23.47
7	1	1	0.3	248.0	-	202.0	-
7	2	13	3.6	248.5	9.31	195.0	23.01
7	3	48	13.4	247.6	7.82	191.6	21.71
7	4	37	10.3	247.2	6.61	187.5	18.79
8	3	1	0.3	237.0	-	149.0	-
8	4	11	3.1	256.6	8.56	221.2	27.34
8	5	19	5.3	254.1	8.56	203.7	18.96
9	5	13	3.6	256.2	5.78	213.1	21.82
9	6	8	2.2	255.8	11.72	210.0	22.45
10	5	1	0.3	268.0	-	252.0	-
10	6	3	0.8	254.0	5.57	199.3	9.29
10	7	5	1.4	256.6	3.58	204.4	21.03
11	7	1	0.3	253.0	-	211.0	-
11	8	1	0.3	258.0	-	227.0	-
Female							
3	0	8	2.6	214.9	9.64	121.8	24.79
4	0	16	5.1	232.2	8.81	157.6	18.29
4	1	12	3.8	233.5	9.27	162.3	21.40
5	0	3	1.0	256.7	15.04	211.0	42.46
5	1	17	5.5	244.1	12.29	192.3	35.61
5	2	12	3.9	250.4	6.08	203.5	18.03
6	1	6	1.9	261.7	7.66	251.2	30.35
6	2	43	13.8	255.4	9.08	221.6	30.78
6	3	57	18.4	256.5	5.97	222.2	24.67
7	2	21	6.8	260.1	7.28	243.4	22.42
7	3	40	12.9	260.6	7.76	237.4	26.51
7	4	27	8.7	264.3	7.43	245.7	23.58
8	3	4	1.3	271.3	7.89	274.3	24.60
8	4	8	2.6	266.6	6.16	253.6	21.13
8	5	12	3.9	271.3	8.30	268.6	38.75
9	4	2	0.6	265.0	-	250.5	7.78
9	5	6	1.9	276.7	11.57	285.2	29.77
9	6	9	2.9	271.6	5.53	261.0	26.02
10	6	3	1.0	274.0	5.29	289.7	32.58
10	7	4	1.3	284.3	12.12	327.8	38.54
11	7	1	0.3	280.0	-	306.0	-

TABLE 6f. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1980.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	6	1.6	194.5	6.16	86.0	10.02
4	0	32	8.7	236.9	11.90	165.3	27.15
4	1	25	6.8	233.7	8.59	158.0	7.54
5	0	14	3.8	244.2	8.80	183.2	29.55
5	1	40	10.8	241.8	9.24	176.5	21.56
5	2	37	10.0	240.1	7.79	176.7	18.03
6	0	1	0.3	250.0	-	193.0	-
6	1	7	1.9	245.9	7.84	180.4	19.28
6	2	27	7.3	250.4	8.68	201.4	23.61
6	3	26	7.1	249.4	7.10	195.9	17.88
7	2	6	1.6	257.3	10.17	215.5	29.05
7	3	46	12.4	253.5	9.74	211.6	28.79
7	4	27	7.3	253.1	8.87	207.5	21.28
8	3	4	1.1	259.3	9.54	228.8	29.49
8	4	18	4.9	259.7	9.13	219.4	29.05
8	5	19	5.1	254.6	6.17	207.8	19.49
9	4	3	0.8	264.7	9.29	234.7	33.56
9	5	9	2.4	259.9	4.88	225.1	11.25
9	6	14	3.8	262.6	7.58	231.2	19.89
10	6	2	0.5	253.0	7.07	225.5	20.51
10	7	4	1.1	257.0	6.78	227.3	30.21
11	7	1	0.3	270.0	-	263.0	-
11	8	2	0.5	264.0	2.83	233.0	12.73
Female							
3	0	2	0.6	222.0	36.77	141.0	82.02
4	0	38	12.0	246.5	9.82	189.3	28.44
4	1	16	5.0	243.3	7.99	181.4	19.97
5	0	31	9.8	252.7	10.25	209.1	30.10
5	1	33	10.4	253.1	7.32	212.0	22.18
5	2	20	6.3	254.9	7.99	224.3	26.92
6	0	1	0.3	267.0	-	245.0	-
6	1	5	1.6	263.0	3.87	250.8	8.70
6	2	17	5.4	262.4	9.41	249.4	29.39
6	3	8	2.5	268.8	7.50	264.9	30.62
7	2	6	1.9	269.7	5.99	271.7	19.15
7	3	38	12.0	266.5	7.57	261.5	26.69
7	4	18	5.7	263.9	9.73	252.8	32.94
8	2	1	0.3	263.0	-	245.0	-
8	3	8	2.5	267.1	7.66	268.4	19.06
8	4	29	9.1	275.7	10.70	289.8	34.87
8	5	11	3.5	272.0	11.14	277.6	46.89
9	4	2	0.6	275.5	24.75	277.0	113.14
9	5	12	3.8	281.5	9.60	308.8	31.66
9	6	7	2.2	280.6	8.06	306.0	28.14
10	5	1	0.3	264.0	-	257.0	-
10	6	8	2.5	282.6	13.53	310.3	52.83
10	7	4	1.3	289.0	9.70	330.3	38.38
11	8	2	0.6	278.5	7.78	283.5	50.20

TABLE 6g. Mean fork length and weight of blueback herring, by age and sex, in relation to spawning history, Mactaquac Dam, 1981.

Age (yr)	No. of previous spawnings	No. of fish	% of sample	Mean length (mm)	SD	Mean weight (g)	SD
Male							
3	0	15	4.6	208.2	10.37	110.1	22.17
4	0	33	10.0	226.6	14.44	144.1	30.21
4	1	26	7.9	230.1	9.25	150.9	18.88
5	0	22	6.7	238.7	8.32	169.2	19.71
5	1	72	21.9	241.3	11.05	176.0	28.89
5	2	21	6.4	243.6	9.79	188.7	33.20
6	1	4	1.2	244.5	12.34	184.5	32.46
6	2	17	5.2	249.3	8.60	199.8	19.07
6	3	17	5.2	248.9	11.26	200.4	30.68
7	1	1	0.3	260.0	-	222.0	-
7	2	3	0.9	247.3	7.02	191.3	18.45
7	3	12	3.7	255.9	5.65	215.1	20.43
7	4	15	4.6	258.3	8.40	222.8	26.27
8	1	1	0.3	272.0	-	263.0	-
8	4	21	6.4	262.3	8.53	235.5	29.16
8	5	18	5.4	261.1	6.61	239.6	34.00
9	4	1	0.3	245.0	-	183.0	-
9	5	8	2.4	263.1	6.33	231.8	22.58
9	6	14	4.3	259.1	3.94	226.2	20.87
10	6	3	0.9	261.7	8.50	260.0	29.44
10	7	1	0.3	260.0	-	222.0	-
11	8	3	0.9	264.0	7.21	241.7	17.62
Female							
3	0	4	1.1	227.0	10.92	147.5	23.80
4	0	35	10.0	238.5	14.80	173.5	36.73
4	1	14	4.0	244.4	8.63	191.3	34.70
5	0	28	8.0	243.6	11.82	182.4	29.39
5	1	96	27.4	251.6	10.62	211.5	32.69
5	2	22	6.3	257.5	8.41	224.0	30.69
6	0	1	0.3	258.0	-	229.0	-
6	1	8	2.3	259.1	11.04	222.3	32.35
6	2	33	9.4	262.4	6.99	248.3	33.38
6	3	24	6.9	260.0	8.74	241.0	27.84
7	1	1	0.3	258.0	-	253.0	-
7	2	1	0.3	278.0	-	299.0	-
7	3	12	3.4	271.0	10.63	275.6	33.59
7	4	8	2.3	265.8	6.92	254.3	26.97
8	3	1	0.3	266.0	-	245.0	-
8	4	14	4.0	271.2	11.36	277.0	36.11
8	5	16	4.6	271.4	8.97	274.5	27.05
9	4	4	1.1	278.3	18.39	292.5	44.61
9	5	10	2.9	282.1	7.40	314.7	38.45
9	6	6	1.7	273.5	11.96	278.8	27.74
10	6	4	1.1	280.5	6.14	319.3	28.61
10	7	4	1.2	287.3	6.88	319.3	32.94
11	7	3	0.9	296.3	4.73	325.3	54.50
11	8	2	0.6	291.0	8.49	327.0	36.77

TABLE 7. Age at first spawning (maturity), by sex and year, for alewife at Mactaquac Dam.

Age at first spawning (yr)	1975				1976				1977				1978			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3	28	17.6	14	11.4	8	5.5	2	1.8	5	4.0	2	2.0	4	1.9	3	1.6
4	100	63.7	74	60.2	102	70.3	68	61.3	82	65.1	38	37.6	62	29.0	42	22.1
5	28	17.6	35	28.5	33	22.8	38	34.2	39	31.0	56	55.5	121	56.5	102	53.7
6	1	0.6	0	-	2	1.4	3	2.7	0	-	5	5.0	27	12.6	42	22.1
7	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	0.5
Total	157	100.0	123	100.0	145	100.0	111	100.0	126	100.0	101	100.0	214	100.0	190	100.0
Mean age	4.0		4.2		4.2		4.4		4.3		4.6		4.8		5.0	
SD	0.62		0.61		0.55		0.57		0.53		0.61		0.67		0.71	

Age at first spawning (yr)	1979				1980				1981			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3	21	5.9	14	5.6	24	6.5	21	5.0	42	12.6	51	13.1
4	77	21.5	37	14.7	95	25.5	110	26.2	102	30.6	101	25.4
5	233	65.1	176	70.1	234	62.9	256	61.0	168	50.5	213	53.5
6	25	7.0	23	9.2	19	5.1	32	7.6	21	6.3	32	8.0
7	2	0.6	1	0.4	0	-	1	0.2	0	-	0	-
Total	358	100.0	251	100.0	372	100.0	420	100.0	333	100.0	398	100.0
Mean age	4.8		4.8		4.7		4.7		4.5		4.6	
SD	0.67		0.66		0.67		0.69		0.79		0.82	

TABLE 8. Age at first spawning (maturity), by sex and year, for blueback herring at Mactaquac Dam.

Age at first spawning (yr)	1975				1976				1977				1978			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3	48	59.3	30	42.3	33	30.6	18	24.0	31	34.1	6	8.0	32	26.0	13	8.0
4	31	38.3	37	52.1	67	62.0	52	69.3	50	55.0	50	64.9	75	61.0	112	69.1
5	2	2.5	4	5.6	8	7.4	5	6.7	10	11.0	19	24.7	16	13.0	35	21.6
6	0	-	0	-	0	-	0	-	0	-	2	2.6	0	-	2	1.2
7	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Total	81	100.0	71	100.0	108	100.0	75	100.0	91	100.0	77	100.0	123	100.0	162	100.0
Mean age	3.4		3.6		3.8		3.8		3.8		4.2		3.9		4.2	
SD	0.55		0.59		0.57		0.53		0.63		0.62		0.61		0.57	

Age at first spawning (yr)	1979				1980				1981			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
3	174	48.5	144	46.3	160	43.2	88	27.7	131	39.8	100	28.5
4	160	44.6	131	42.1	175	47.3	175	55.0	166	50.5	207	59.0
5	23	6.4	36	11.6	34	9.2	53	16.7	30	9.1	42	12.0
6	2	0.6	0	-	1	0.3	2	0.6	1	0.3	2	0.6
7	0	-	0	-	0	-	0	-	1	0.3	0	-
Total	359	100.0	311	100.0	370	100.0	318	100.0	329	100.0	351	100.0
Mean age	3.6		3.7		3.7		3.9		3.7		3.8	
SD	0.64		0.68		0.65		0.68		0.67		0.64	

TABLE 9. Length-frequency distribution of mature alewives, by sex and year, Mactaquac Dam.

Fork length (mm)	1975				1976				1977				1978			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
160-169	1	0.6	0	-	0	-	0	-	0	-	0	-	0	-	0	-
200-209	0	-	1	0.8	0	-	0	-	0	-	0	-	0	-	0	-
210-219	2	1.2	0	-	0	-	0	-	0	-	0	-	2	0.9	0	-
220-229	8	4.9	1	0.8	2	1.3	0	-	2	1.6	0	-	3	1.4	0	-
230-239	22	13.6	8	6.2	9	6.0	2	1.8	6	4.7	0	-	5	2.3	0	-
240-249	32	19.8	11	8.5	15	9.9	2	1.8	12	9.3	3	3.0	10	4.6	2	1.0
250-259	14	8.6	20	15.4	25	16.6	17	15.0	36	27.9	14	13.9	49	22.4	11	5.7
260-269	38	23.5	16	12.3	38	25.2	25	22.1	19	14.7	23	22.8	73	33.3	41	21.4
270-279	33	20.4	30	23.1	34	22.5	25	22.1	38	29.5	28	27.7	57	26.0	73	38.0
280-289	10	6.2	29	22.3	23	15.2	22	19.5	14	10.9	19	18.8	16	7.3	38	19.8
290-299	2	1.2	13	10.0	5	3.3	15	13.3	2	1.6	9	8.9	3	1.4	23	12.0
300-309	0	-	1	0.8	0	-	5	4.4	0	-	5	5.0	1	0.5	3	1.6
310-319	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	0.5
320-329	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
340-349	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
390-399	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Totals	162		130		151		113		129		101		219		192	

Fork length (mm)	1979				1980				1981			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
160-169	0	-	0	-	0	-	0	-	0	-	0	-
200-209	0	-	0	-	0	-	0	-	0	-	0	-
210-219	0	-	0	-	0	-	0	-	0	-	1	0.2
220-229	2	0.6	0	-	0	-	0	-	2	0.5	0	-
230-239	7	1.9	1	0.4	1	0.3	0	-	5	1.4	0	-
240-249	28	7.7	6	2.3	6	1.6	2	0.5	15	4.1	7	1.6
250-259	29	8.0	10	3.9	25	6.5	12	2.8	59	16.0	37	8.6
260-269	62	17.0	19	7.4	71	18.6	28	6.5	91	24.6	66	15.3
270-279	143	39.2	48	18.6	109	28.5	69	16.1	84	22.7	98	22.5
280-289	74	20.3	94	36.4	122	31.9	93	21.7	82	22.1	88	20.4
290-299	18	4.9	59	22.9	42	11.0	137	31.9	25	6.8	74	17.2
300-309	2	0.6	19	7.4	6	1.6	69	16.1	4	1.1	46	10.7
310-319	0	-	1	0.4	0	-	16	3.7	3	0.8	9	2.1
320-329	0	-	0	-	0	-	3	0.7	0	-	4	0.9
340-349	0	-	0	-	0	-	0	-	0	-	1	0.2
390-399	0	-	1	0.39	0	-	0	-	0	-	0	-
Totals	365		258		382		429		370		431	

TABLE 10. Length-frequency distribution of mature blueback herring, by sex and year, Mactaquac Dam.

Fork length (mm)	1975				1976				1977				1978			
	Male		Female		Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
170-179	1	1.2	0	-	1	0.9	0	-	0	-	0	-	0	-	0	-
180-189	1	1.2	0	-	3	2.8	1	1.3	0	-	0	-	1	0.8	0	-
190-199	9	11.0	1	1.3	11	10.2	2	2.6	1	1.1	0	-	1	0.8	0	-
200-209	7	8.5	3	4.0	17	15.7	5	6.4	1	1.1	0	-	5	4.0	2	1.2
210-219	15	18.3	5	6.6	10	9.3	4	5.1	11	12.0	3	3.9	8	6.5	1	0.6
220-229	13	15.9	13	17.1	26	24.1	14	18.0	22	23.9	8	10.3	6	4.8	8	4.9
230-239	23	28.1	16	21.1	21	19.4	16	20.5	33	35.9	18	23.1	34	27.4	10	6.1
240-249	11	13.4	17	22.3	12	11.1	11	14.1	17	18.5	19	24.4	38	30.7	44	26.7
250-259	1	1.2	14	18.4	7	6.5	12	15.4	6	6.5	15	19.2	24	19.4	57	34.6
260-269	1	1.2	6	7.9	0	-	7	9.0	1	1.1	7	9.0	7	5.7	32	19.4
270-279	0	-	1	1.3	0	-	6	7.7	0	-	7	9.0	0	-	7	4.2
280-289	0	-	0	-	0	-	0	-	0	-	1	1.3	0	-	3	1.8
290-299	0	-	0	-	0	-	0	-	0	-	0	-	0	-	1	0.6
300-309	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Totals	82		76		108		78		92		78		124		165	

Fork length (mm)	1979				1980				1981			
	Male		Female		Male		Female		Male		Female	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
170-179	0	-	0	-	0	-	0	-	0	-	0	-
180-189	3	0.8	0	-	1	0.3	0	-	1	0.3	0	-
190-199	1	0.3	0	-	5	1.4	1	0.3	3	0.9	0	-
200-209	5	1.4	3	1.0	0	-	0	-	9	2.7	1	0.3
210-219	22	6.1	4	1.3	4	1.1	0	-	12	3.6	4	1.1
220-229	30	8.3	14	4.5	21	5.7	3	0.9	35	10.4	13	3.6
230-239	52	14.3	17	5.4	62	16.8	21	6.6	52	15.4	29	8.1
240-249	130	35.8	30	9.6	96	26.0	41	12.9	81	24.0	51	14.3
250-259	81	22.3	109	34.8	117	31.6	77	24.2	83	24.6	109	30.5
260-269	34	9.4	86	27.5	55	14.9	82	25.8	44	13.1	72	20.1
270-279	4	1.1	38	12.1	6	1.6	59	18.6	16	4.8	47	13.1
280-289	1	0.3	10	3.2	3	0.8	19	6.0	1	0.3	20	5.6
290-299	0	-	1	0.3	0	-	13	4.1	0	-	10	2.8
300-309	0	-	1	0.3	0	-	2	0.6	0	-	2	0.6
Totals	363		313		370		318		337		358	

TABLE 11a. Mean weight of alewife, by sex and age, Mactaquac Dam, 1975.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	47	177.5	114-296	27.29	20	198.7	146-290	32.33
5	33	211.2	116-283	35.04	36	264.3	192-370	44.82
6	55	255.2	143-313	30.92	34	300.5	206-409	50.68
7	18	284.6	185-346	35.89	30	337.7	259-409	39.69
8	4	284.0	248-305	26.85	3	361.3	340-393	27.97

TABLE 11b. Mean weight of alewife, by sex and age, Mactaquac Dam, 1976.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	7	190.1	168-223	16.58	2	241.5	241-242	-
5	43	223.2	130-353	38.38	39	248.4	175-317	34.52
6	55	262.6	146-359	45.23	35	306.4	224-402	46.68
7	32	286.5	158-357	41.43	31	349.7	284-432	37.97
8	8	322.6	257-356	37.11	4	329.5	228-379	70.04

TABLE 11c. Mean weight of alewife, by sex and age, Mactaquac Dam, 1977.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	21	191.3	156-234	23.11	6	225.0	184-273	34.47
5	32	251.1	166-282	26.79	31	250.6	193-316	31.33
6	47	245.2	191-304	25.64	33	281.9	216-371	39.93
7	22	264.9	221-319	24.78	24	315.3	245-412	44.94
8	4	275.3	255-288	14.73	7	329.6	243-384	52.05

TABLE 11d. Mean weight of alewife, by sex and age, Mactaquac Dam, 1978.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	10	184.2	142-223	30.20	0	-	-	-
5	82	221.8	145-281	27.69	58	266.4	188-337	32.17
6	74	248.7	203-306	21.92	76	285.4	216-359	31.27
7	37	264.6	203-334	29.14	37	302.7	207-399	34.58
8	9	284.0	223-319	29.76	16	342.9	276-412	42.95
9	2	315.5	259-372	-	3	329.0	292-353	32.51

TABLE 11e. Mean weight of alewife, by sex and age, Mactaquac Dam, 1979.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	2	153.5	152-155	-	0	-	-	-
4	27	192.2	168-243	16.70	9	228.7	185-302	43.44
5	70	232.3	159-324	33.56	46	270.2	183-337	36.19
6	181	275.4	202-392	32.64	139	329.2	234-407	33.55
7	60	289.5	218-376	33.12	44	354.1	281-453	38.37
8	15	295.3	254-384	31.37	10	371.0	304-420	38.67
9	3	293.3	246-324	41.59	2	338.5	330-347	-

TABLE 11f. Mean weight of alewife, by sex and age, Mactaquac Dam, 1980.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	27	228.7	165-294	28.56	20	250.2	192-365	39.02
5	91	246.6	177-312	28.14	85	292.3	223-369	34.25
6	64	280.1	217-365	31.53	67	325.5	216-424	38.61
7	145	299.9	225-390	28.90	156	355.2	229-501	41.66
8	37	306.7	243-375	34.81	65	377.4	270-480	41.29
9	7	314.4	259-359	35.57	25	371.4	287-467	46.16
10	1	286.0	-	-	1	406.0	-	-

TABLE 11g. Mean weight of alewife, by sex and age, Mactaquac Dam, 1981.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
4	38	216.2	140-277	38.73	36	248.5	193-352	35.76
5	172	252.3	168-339	36.76	180	288.2	193-376	38.38
6	58	273.2	193-398	39.67	88	317.0	208-401	41.34
7	45	307.2	226-388	32.05	54	368.2	292-473	36.23
8	18	316.8	241-433	45.23	28	382.2	303-492	49.84
9	2	337.5	331-334	9.19	10	401.7	335-499	53.99
10	0	-	-	-	2	441.5	395-488	65.76

TABLE 12a. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1975.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	12	92.1	68-184	31.26	2	90.0	86-94	-
4	24	121.4	77-216	28.91	21	134.4	90-170	19.97
5	9	124.8	105-140	10.69	14	164.3	126-267	34.13
6	27	159.8	132-229	24.00	24	191.6	139-260	25.17
7	9	162.8	150-182	13.08	8	207.1	152-243	30.27
8	0	-	-	-	2	185.0	141-229	-

TABLE 12b. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1976.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	3	85.3	74-106	17.93	1	83.0	-	-
4	39	103.5	74-158	21.10	16	128.3	82-169	26.22
5	28	141.8	93-214	26.29	22	159.0	117-229	24.86
6	12	159.7	128-207	22.30	18	182.7	107-262	36.67
7	16	157.9	116-209	23.85	7	200.4	141-233	34.40
8	9	203.1	178-235	20.35	8	241.3	203-279	27.20
9	1	203.0	-	-	3	270.7	247-293	23.03

TABLE 12c. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1977.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	1	94.0	-	-	0	-	-	-
4	15	133.8	102-171	19.69	5	148.4	129-167	15.92
5	42	148.4	114-206	20.17	36	168.6	117-229	24.05
6	20	169.3	145-204	16.27	18	212.4	164-272	30.22
7	9	188.0	137-232	32.98	8	210.6	143-283	47.47
8	3	179.7	151-210	29.54	5	275.2	263-284	10.28
9	1	179.0	-	-	5	259.8	222-319	38.83

TABLE 12d. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1978.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	6	98.7	74-129	19.60	3	113.7	99-140	22.86
4	10	129.9	109-178	24.45	5	142.4	122-164	15.85
5	22	177.1	124-261	36.94	34	190.7	140-256	26.43
6	54	172.5	135-208	17.08	75	205.7	152-326	27.33
7	16	185.6	158-224	18.79	26	224.5	188-302	23.08
8	10	189.5	157-224	22.22	14	250.2	197-319	30.76
9	3	214.7	193-248	29.30	4	288.0	257-312	27.82
10	2	203.5	197-210	-	1	317.0	-	-

TABLE 12e. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1979.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	17	105.0	75-144	18.88	8	121.8	94-171	24.80
4	45	136.0	108-177	19.90	28	159.6	128-206	19.00
5	28	153.7	126-200	18.22	32	198.3	148-263	30.53
6	107	185.4	137-290	25.42	106	223.6	172-347	28.42
7	99	190.6	148-265	20.70	88	241.4	172-311	24.72
8	31	208.1	149-261	25.41	24	264.5	215-329	31.61
9	21	211.9	176-254	21.55	17	268.3	222-317	28.21
10	9	208.0	184-252	22.83	7	311.4	267-367	36.27
11	2	219.0	211-227	-	1	306.0	-	-

TABLE 12f. Mean weight of blueback herring, by sex and age, Mactaquac Dam, 1980.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	6	86.0	73-98	10.02	2	141.0	83-199	-
4	57	162.1	116-218	23.43	54	187.0	140-239	26.15
5	91	177.6	130-247	21.53	84	213.9	161-306	27.16
6	61	196.5	139-255	21.17	31	253.5	203-321	27.16
7	79	210.5	153-281	26.25	62	259.9	177-339	28.19
8	41	215.0	163-278	27.23	49	282.7	221-415	36.34
9	26	229.5	200-275	18.66	21	304.8	197-359	38.92
10	6	226.7	195-264	25.15	13	312.3	257-431	48.60

TABLE 12g. Mean weight of blueback herring, by sex and age, Mactaquac Dam,1981.

Age (yr)	Weight (g)							
	Male				Female			
	No. of fish	Mean	Range	SD	No. of fish	Mean	Range	SD
3	15	110.1	72-159	21.64	4	147.5	115-171	23.80
4	59	147.1	95-204	25.76	49	178.6	101-286	36.37
5	115	177.0	129-305	28.51	146	207.8	133-289	34.13
6	38	198.5	139-270	25.49	66	242.2	183-334	31.55
7	31	216.7	171-292	24.14	22	266.8	197-318	31.28
8	40	238.1	178-322	30.55	31	274.7	225-353	31.03
9	23	226.3	183-262	22.29	20	299.5	239-360	38.52
10	4	250.5	222-277	30.64	8	319.3	296-361	25.88

TABLE 13. Mean fork lengths, by sample date and year, for alewife at Mactaquac Dam (sexes combined).

1975				1976				1977			
Date	n	x̄(mm)	SD	Date	n	x̄(mm)	SD	Date	n	x̄(mm)	SD
23 May	50	279.3	9.89	19 May	49	276.8	13.72	24 May	50	269.5	12.67
30 May	49	269.6	14.91	24 May	49	276.2	12.01	31 May	50	270.2	14.11
5 Jun	48	255.0	17.09	31 May	50	268.2	15.97	7 Jun	50	270.7	13.44
13 Jun	48	260.4	20.95	7 Jun	48	266.5	13.94	14 Jun	43	262.4	13.25
20 Jun	50	257.1	17.63	14 Jun	43	258.7	14.15	21 Jun	5	273.4	18.58
26 Jun	39	245.1	17.41	21 Jun	20	256.0	21.75	28 Jun	6	255.7	18.15
4 Jul	6	240.7	13.47	28 Jun	5	264.2	13.75	5 Jul	13	248.2	6.95
11 Jul	2	240.0	-	5 Jul	0	-	-	12 Jul	13	248.9	11.30
18 Jul	0	-	-	12 Jul	0	-	-				

1978				1979				1980			
Date	n	x̄(mm)	SD	Date	n	x̄(mm)	SD	Date	n	x̄(mm)	SD
24 May	50	273.0	9.61	25 May	100	283.9	11.45	13 May	100	288.1	11.67
29 May	50	274.8	11.99	29 May	99	278.7	12.18	16 May	100	292.0	11.92
1 Jun	50	271.9	11.01	1 Jun	81	278.9	12.55	20 May	100	285.5	14.34
5 Jun	46	271.8	10.25	5 Jun	86	278.3	12.40	23 May	98	283.6	11.79
8 Jun	50	272.9	10.54	8 Jun	94	273.8	19.19	27 May	98	281.1	12.15
12 Jun	43	267.3	13.06	12 Jun	70	269.1	16.05	30 May	90	279.0	14.03
14 Jun	36	265.3	14.28	15 Jun	43	272.4	16.14	3 Jun	73	281.7	13.09
19 Jun	28	271.1	14.42	19 Jun	28	264.1	14.99	6 Jun	61	279.0	14.33
22 Jun	9	261.4	18.93	22 Jun	17	267.7	16.83	10 Jun	46	274.5	13.29
26 Jun	5	262.8	10.50	26 Jun	2	253.5	-	13 Jun	15	277.6	15.57
29 Jun	7	261.6	14.01	29 Jun	2	263.0	-	17 Jun	5	261.8	20.12
3 Jul	10	263.6	18.72	3 Jul	2	239.5	-	20 Jun	22	266.4	14.98
5 Jul	26	254.2	16.94					24 Jun	3	258.7	18.82
10 Jul	1	271.0	-								

1981			
Date	n	x̄(mm)	SD
12 May	100	286.4	16.24
14 May	100	287.1	15.16
20 May	100	276.8	14.48
22 May	100	276.4	13.76
25 May	100	271.4	12.84
28 May	94	274.8	17.53
1 Jun	86	269.9	13.82
4 Jun	44	271.1	15.68
8 Jun	34	269.4	13.83
11 Jun	9	266.3	15.91
15 Jun	15	260.4	16.99
18 Jun	7	265.0	11.34
22 Jun	3	261.0	11.36
26 Jun	1	290.0	-
30 Jun	8	246.9	16.62

TABLE 14. Mean fork lengths, by sample date and year, for blueback herring at Mactaquac Dam (sexes combined).

1975				1976				1977			
Date	n	$\bar{x}$(mm)	SD	Date	n	$\bar{x}$(mm)	SD	Date	n	$\bar{x}$(mm)	SD
23 May	0	-	-	19 May	1	232.0	-	24 May	0	-	-
30 May	1	224.0	-	24 May	1	253.0	-	31 May	0	-	-
5 Jun	2	255.0	-	31 May	0	-	-	7 Jun	0	-	-
13 Jun	2	234.5	-	7 Jun	2	243.0	4.24	14 Jun	7	238.6	17.96
20 Jun	0	-	-	14 Jun	7	231.1	23.99	21 Jun	45	244.7	15.89
26 Jun	11	228.7	20.34	21 Jun	30	230.6	14.96	28 Jun	44	241.3	14.43
4 Jul	44	232.0	19.16	28 Jun	45	229.7	18.17	5 Jul	37	236.2	14.57
11 Jul	48	228.8	19.78	5 Jul	50	233.3	23.61	12 Jul	37	230.2	12.06
18 Jul	50	229.4	18.08	12 Jul	50	217.7	21.25				

1978				1979				1980			
Date	n	$\bar{x}$(mm)	SD	Date	n	$\bar{x}$(mm)	SD	Date	n	$\bar{x}$(mm)	SD
				29 May	1	279.0	-	23 May	2	289.0	-
5 Jun	4	265.3	12.20	1 Jun	19	264.6	19.49	27 May	2	258.5	-
12 Jun	7	252.4	12.08	5 Jun	14	259.6	13.68	30 May	10	262.8	15.67
14 Jun	14	251.5	11.96	8 Jun	6	262.3	13.84	3 Jun	27	258.2	11.32
19 Jun	22	253.5	13.31	12 Jun	30	252.7	16.95	6 Jun	39	256.5	14.93
22 Jun	41	252.6	12.17	15 Jun	57	248.9	14.40	10 Jun	54	259.7	14.56
26 Jun	45	248.7	13.72	19 Jun	72	247.3	16.02	13 Jun	85	255.4	13.58
29 Jun	43	249.7	12.75	22 Jun	83	244.9	17.21	17 Jun	95	256.2	15.41
3 Jul	40	238.1	16.68	26 Jun	98	251.1	13.62	20 Jun	78	248.4	15.01
5 Jul	24	240.7	14.36	29 Jun	98	245.3	18.86	24 Jun	96	252.9	16.87
10 Jul	49	238.2	18.57	3 Jul	98	246.0	17.43	27 Jun	100	253.6	16.31
				6 Jul	100	251.7	12.64	1 Jul	100	249.1	18.06

1981			
Date	n	$\bar{x}$(mm)	SD
28 May	6	260.0	13.16
1 Jun	14	260.6	15.67
4 Jun	56	258.9	15.28
8 Jun	66	255.7	15.43
11 Jun	91	255.8	15.33
15 Jun	85	249.7	16.02
18 Jun	93	250.2	16.60
22 Jun	97	248.0	15.91
26 Jun	99	254.4	15.81
30 Jun	88	235.3	21.06

TABLE 15a. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1975.

Fork length (mm)	Age-group 4	5	6	7	8	Totals
160-169			1			1
170-179						0
180-189						0
190-199			1			1
200-209						0
210-219	1	1				2
220-229	11	2	1			14
230-239	26	6				32
240-249	25	13	2			40
250-259	4	20	10	3		37
260-269		14	39		1	54
270-279		9	23	20	1	53
280-289		3	9	19	4	35
290-299		1	3	5	1	10
300-309						1
Totals	67	69	89	48	7	280
Percent	23.9	24.6	31.8	17.1	2.5	

TABLE 15b. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1976.

Fork length (mm)	Age-group 4	5	6	7	8	Totals
220-229		1	1			2
230-239	2	7	1	1		11
240-249	4	10	3			17
250-259	2	25	13	1		41
260-269	1	29	25	7	1	63
270-279		8	27	21	2	58
280-289		2	15	17	7	41
290-299		4	14	2		20
300-309		1	2			3
Totals	9	87	101	49	10	256
Percent	3.5	34.0	39.5	19.1	3.9	

TABLE 15c. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1977.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
180-189	1									1
190-199	1	2								3
200-209		8	8							16
210-219		7	11	2						20
220-229		4	16	2						22
230-239			10	9	4					23
240-249			8	5	7	2				22
250-259			1	5	6					12
260-269				1	7	8	1		1	18
270-279				1	1	1		2		5
280-289										0
290-299							1	1		2
Totals	2	21	54	25	25	11	2	3	1	144
Percent	1.4	14.6	37.5	17.4	17.4	7.6	1.4	2.1	0.7	

TABLE 15d. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1978.

Fork length (mm)	Age-group 4	5	6	7	8	9	10	Totals
210-219	1	1						2
220-229	2	1						3
230-239	2	3						5
240-249	2	13	1					16
250-259	3	43	19	3				68
260-269		55	52	16	1	1		125
270-279		21	60	26	7			114
280-289		3	17	20	8	1		49
290-299			1	9	8	2	1	21
300-309					1			1
Totals	10	140	150	74	25	4	1	404
Percent	2.5	34.7	37.1	18.3	6.2	1.0	0.3	

TABLE 15e. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1979.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	Totals
220-229	2		1					3
230-239		8	2					10
240-249		19	15					34
250-259		5	34	3	1			43
260-269		2	31	45	5	1	1	85
270-279		2	28	125	27	10	1	193
280-289			5	107	41	6	1	160
290-299				39	20	5	2	66
300-309				2	9	3		14
310-319					1			1
Totals	2	36	116	321	104	25	5	609
Percent	0.3	5.9	19.1	52.7	17.1	4.1	0.8	

TABLE 15f. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1980.

Fork length (mm)	Age-group 4	5	6	7	8	9	10	11	Totals
230-239	1								1
240-249	7	3							10
250-259	14	22	2	1					39
260-269	18	63	14	9	1				105
270-279	6	59	53	47	11	1			177
280-289		25	43	121	21	5	1		216
290-299	1	4	17	91	44	12			169
300-309			2	26	18	12	1		59
310-319				5	5	2		1	13
320-329				1	2				3
Totals	47	176	131	301	102	32	2	1	792
Percent	5.9	22.2	16.5	38.0	12.9	4.0	0.3	0.1	

TABLE 15g. Observed length-frequencies of alewife, by age-groups, sexes combined, Mactaquac Dam, 1981.

Fork length (mm)	Age-group							Totals
	4	5	6	7	8	9	10	
210-219		1						1
220-229	3							3
230-239	3	2						5
240-249	14	16						30
250-259	26	61	14					101
260-269	21	105	17	1	2			146
270-279	5	107	49	11	3			175
280-289	2	54	44	30	12			142
290-299		6	19	43	12	4		84
300-309			3	12	13	4		32
310-319				2	4	2	2	10
320-329						1		1
330-339								0
340-349						1		1
Totals	74	352	146	99	46	12	2	731
Percent	10.1	48.2	20.0	13.5	6.3	1.6	0.3	

TABLE 16a. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1975.

Fork length (mm)	Age-group 3	4	5	6	7	8	Totals
170-179	1						1
180-189	3						3
190-199	6	2					8
200-209	4	6	1				11
210-219		16	6	1			23
220-229		14	6	5		1	26
230-239		6	8	18	6		38
240-249		1	1	16	6		24
250-259				8	3	1	12
260-269			1	2	2		5
270-279				1			1
Totals	14	45	23	51	17	2	152
Percent	9.2	29.6	15.1	33.6	11.2	1.3	

TABLE 16b. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1976.

Fork length (m)	Age-group 3	4	5	6	7	8	9	Totals
170-179		1						1
180-189	1	3						4
190-199	2	11						13
200-209	1	19	2					22
210-219		10	4					14
220-229		6	22	7	5			40
230-239		5	16	8	7	1		37
240-249			4	7	6	6		23
250-259			2	7	4	4	1	18
260-269				1	1	4		6
270-279						2	3	5
Totals	4	55	50	30	23	17	4	183
Percent	2.2	30.1	27.3	16.4	12.6	9.3	2.2	

TABLE 16c. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1977.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	Totals
190-199	1							1
200-209								0
210-219		7	7					14
220-229		8	19	1	2			30
230-239		4	29	16	1	1		51
240-249		1	20	11	3	1		36
250-259			2	6	8	1	3	20
260-269			1	3	3	1		8
270-279				1		4	2	7
280-289							1	1
Totals	1	20	78	38	17	8	6	168
Percent	0.6	11.9	46.4	22.6	10.1	4.8	3.6	

TABLE 16d. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1978.

Fork length (mm)	Age-group 3	4	5	6	7	8	19	10	Totals
180-189	2								2
190-199	1								1
200-209	4	3	1						8
210-219	1	4	2	1					8
220-229	1	4	8	5		1			19
230-239		3	13	26	2	1			45
240-249		1	16	55	10	3	1	1	87
250-259			13	32	18	7	1	1	72
260-269			3	9	11	8	3		34
270-279					1	3	2		6
280-289				1		1		1	3
Totals	9	15	56	129	42	24	7	3	285
Percent	3.2	5.3	19.7	45.3	14.7	8.4	2.5	1.1	

TABLE 16e. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1979.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
170-179	1									1
180-189	2									2
190-199	2									2
200-209	9	1								10
210-219	7	18	3							28
220-229	2	29	12	3						46
230-239	2	18	13	23	16	1	1			74
240-249		6	17	71	59	11	5	1		170
250-259		1	11	84	59	12	9	6	2	184
260-269			3	26	39	23	14	3		108
270-279			1	4	14	7	5	4	1	36
280-289				2		1	4	1		8
290-299								1		1
Totals	25	73	60	213	187	55	38	16	3	670
Percent	3.7	10.9	9.0	31.8	27.9	8.2	5.7	2.6	0.5	

TABLE 16f. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1980.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
180-189	1									1
190-199	6									6
200-209		1								1
210-219		4								4
220-229		16	10	1						27
230-239		36	41	5	7	1				90
240-249	1	34	51	27	28	6		2		149
250-259		17	59	37	38	27	14	3		195
260-269		3	11	15	49	26	13	3	3	123
270-279			3	6	18	20	8	5	1	61
280-289				1	1	6	7	1	1	17
290-299						3	5	4		12
300-309						1		1		2
Totals	8	111	175	92	141	90	47	19	5	688
Percent	1.2	16.1	25.4	13.4	20.5	13.1	6.8	2.8	0.7	

TABLE 16g. Observed length-frequencies of blueback herring, by age-groups, sexes combined, Mactaquac Dam, 1981.

Fork length (mm)	Age-group										Totals
	3	4	5	6	7	8	9	10	11	12	
180-189	1										1
190-199	3	1									4
200-209	4	8									12
210-219	7	9									16
220-229	2	25	30	1							58
230-239	2	27	53	7	1						90
240-249		26	74	20	8	1	1				130
250-259		10	78	39	22	24	14	2	1	1	191
260-269		2	23	27	10	26	11	2	2		103
270-279			3	9	9	14	8	3			46
280-289				1	3	5	5	4	1		19
290-299						1	3	1	4		9
300-309							1				1
Totals	19	108	261	104	53	71	43	12	8	1	680
Percent	2.8	15.9	38.4	15.3	7.8	10.4	6.3	1.8	1.2	0.2	

TABLE 17a. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1975.

Fork length (mm)	Age-group 3	4	5	6	7	8	Totals
160-169				1			1
170-179	1						1
180-189	3						3
190-199	6	2		1			9
200-209	4	6	1				11
210-219		17	7	1			25
220-229		25	8	6		1	40
230-239		32	14	18	6		70
240-249		26	14	18	6		64
250-259		4	20	18	6	1	49
260-269			15	41	2	1	59
270-279			9	24	20	1	54
280-289			3	9	19	4	35
290-299			1	3	5	1	10
300-309					1		1
Totals	14	112	92	140	65	9	432
Percent	3.2	25.9	21.3	32.4	15.1	2.1	

TABLE 17b. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1976.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	Totals
170-179		1						1
180-189	1	3						4
190-199	2	11						13
200-209	1	19	2					22
210-219		10	4					14
220-229		6	23	8	5			42
230-239		7	23	9	8	1		48
240-249		4	14	10	6	6		40
250-259		2	27	20	5	4	1	59
260-269		1	29	26	8	5		69
270-279			8	27	21	4		60
280-289			2	15	17	7	3	44
290-299			4	14	2			20
300-309			1	2				3
Totals	4	64	137	131	72	27	4	439
Percent	0.9	14.6	31.2	29.8	16.4	6.2	0.9	

TABLE 17c. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1977.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
180-189	1									1
190-199	2	2								4
200-209		8	8							16
210-219		14	18	2						34
220-229		12	35	3	2					52
230-239		4	39	25	5	1				74
240-249		1	28	16	10	3				58
250-259			3	11	14	1	3			32
260-269			1	4	10	9	1		1	26
270-279				2	1	5	2	2		12
280-289							1			1
290-299							1	1		2
Totals	3	41	132	63	42	19	8	3	1	312
Percent	1.0	13.1	42.3	20.2	13.5	6.1	2.6	1.0	0.3	

TABLE 17d. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1978.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	Totals
180-189	2								2
190-199	1								1
200-209	4	3	1						8
210-219	1	5	3	1					10
220-229	1	6	9	5		1			22
230-239		5	16	26	2	1			50
240-249		3	29	56	10	3	1	1	103
250-259		3	56	51	21	7	1	1	140
260-269			58	61	27	9	4		159
270-279			21	60	27	10	2		120
280-289			3	18	20	9	1	1	52
290-299				1	9	8	2	1	21
300-309						1			1
Totals	9	25	196	279	116	49	11	4	689
Percent	1.3	3.6	28.5	40.5	16.8	7.1	1.6	0.6	

TABLE 17e. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1979.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
170-179	1									1
180-189	2									2
190-199	2									2
200-209	9	1								10
210-219	7	18	3							28
220-229	4	29	13	3						49
230-239	2	26	15	23	16	1	1			84
240-249		25	32	71	59	11	5	1		204
250-259		6	45	87	60	12	9	6	2	227
260-269		2	34	71	44	24	15	3		193
270-279		2	29	129	41	17	6	4	1	229
280-289			5	109	41	7	5	1		168
290-299				39	20	5	2	1		67
300-309				2	9	3				14
310-319					1					1
Totals	27	109	176	534	291	80	43	16	3	1,279
Percent	2.1	8.5	13.8	41.8	22.8	6.3	3.4	1.3	0.2	

TABLE 17f. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1980.

Fork length (mm)	Age-group 3	4	5	6	7	8	9	10	11	Totals
180-189	1									1
190-199	6									6
200-209		1								1
210-219		4								4
220-229		16	10	1						27
230-239		37	41	5	7	1				91
240-249	1	41	54	27	28	6		2		159
250-259		31	81	39	39	27	14	3		234
260-269		21	74	29	58	27	13	3	3	228
270-279		6	62	59	65	31	9	5	1	238
280-289			25	44	122	27	12	2	1	233
290-299		1	4	17	91	47	17	4		181
300-309				2	26	19	12	2		61
310-319					5	5	2		1	13
320-329					1	2				3
Totals	8	158	351	223	442	192	79	21	6	1,480
Percent	0.5	10.7	23.7	15.1	29.9	13.0	5.3	1.4	0.4	

TABLE 17g. Observed length-frequencies of gaspereau (species combined), by age-groups, sexes combined, Mactaquac Dam, 1981.

Fork length (mm)	Age-group										Totals
	3	4	5	6	7	8	9	10	11	12	
180-189	1										1
190-199	3	1									4
200-209	4	8									12
210-219	7	9	1								17
220-229	2	28	30	1							61
230-239	2	30	55	7	1						95
240-249		40	90	20	8	1	1				160
250-259		36	139	53	22	24	14	2	1	1	292
260-269		23	128	44	11	28	11	2	2		249
270-279		5	110	58	20	17	8	3			221
280-289		2	54	45	33	17	5	4	1		161
290-299			6	19	43	13	7	1	4		93
300-309				3	12	13	5				33
310-319					2	4	2	2			10
320-329							1				1
330-339											0
340-349							1				1
Totals	19	182	613	250	152	117	55	14	8	1	1,411
Percent	1.4	12.9	43.4	17.7	10.8	8.3	3.9	1.0	0.6	0.1	

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